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The Association of Female Genital Mutilation in Sexual Behaviors and Marriageability, Ethiopia DHS 2016

Lemlem Eyob Mehari

ABSTRACT

The Association of Female Genital Mutilation in Sexual Behaviors and Marriageability, Ethiopia DHS 2016

By

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INTRODUCTION: Female genital mutilation (FGM) is a public health issue affecting girls and women worldwide. FGM is practiced in many countries primarily in Africa. In Ethiopia, the prevalence of FGM has been decreasing nationally over the years. However, among different regions and ethnic groups the prevalence varies greatly. FGM is used as a tool to control female sexuality and believed to make girls and women more marriageable. There is limited research studying the relationship of FGM in sexual behaviors and marriageability in Ethiopia.

AIM: The purpose of this study is to determine the relationship of FGM in sexual behaviors and marriageability.

METHODS: This study used secondary data from the 2016 Ethiopia Demographic and Health Survey (EDHS). In this study the sample size of the study's population included 7,151 women between the ages of 15 to 49 who have heard of female genital mutilation/cutting (FGM/C). Multiple lifetime number of sexual partners and early sexual debut were the dependent variables used to measure sexual behaviors. Premarital sex was another dependent variable created to evaluate marriageability since female virginity is considered a prerequisite for marriage. SAS 9.4 was used to run chi-square tests and logistic regressions. Chi-square tests were used to examine associations for categorical variables to compare background characteristics by circumcision status and the dependent variables. Bivariate and multivariate logistic regression were used to analyze the association of FGM to sexual behaviors and marriageability. Sociodemographic characteristics were controlled for during analysis.

RESULTS: In this study, the proportion of the women who knew about FGM and were circumcised was 71%. After controlling for sociodemographic characteristics, a multivariable logistic regression model showed that circumcised women were less likely to have multiple lifetime number of sexual partners (OR = .748; 95% CI = .566, .988). Although nonsignificant, FGM was protective against early sexual debut and premarital sex. The odds of multiple lifetime number of sexual partners increased among ages 24 to 49, non-educated women, Amhara ethnicity, Tigray ethnicity, urban, and in the regions of Tigray, Afar, Amhara, Oromia, Benishangula, Gambela, Addis Ababa, and Dira Dawa. Women who were circumcised, ages 15 to 19, Orthodox, Amhara ethnicity and Sidama ethnicity were more likely to have an early sexual debut. The chances of premarital sex increased among women who were circumcised, ages 20 to 49, Orthodox, and in the region Addis Ababa.

DISCUSSION: Although, FGM was shown to be protective against female sexuality, depending on the type of circumcision done such as Type III which is infibulation, are less likely to engage in sexual intercourse often which may have an effect on the results.

CONCLUSION: These findings suggest a need for more programs and strategies for FGM eradication to be specific for different regions and ethnicities as the prevalence varied based on these two factors. The study shows that further research is needed to show the effects of different types of circumcision has on controlling female sexuality.

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Author's Statement Page

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CHAPTER I

INTRODUCTION

1.1. Background

Female genital mutilation (FGM), also known as female circumcision or female genital cutting, is the partial or total removal of external female genitalia or injury to the female genital organs for non-medical purposes (WHO, 2008). FGM violates human rights and is a widespread public health issue. The prevalence of FGM varies from different cultures and nations. The practice is common among 30 countries primarily in Africa, the Middle East, and Asia (UNICEF, 2013). Although, there has been a decline in the prevalence of FGM for the last three decades, an estimated 100 to 140 million girls and women worldwide have been subjected to this practice and an estimated 3 million girls are at risk each year (UNICEF, 2016). However, prevalence in many areas of Africa, where it is predominately practiced, still remains high. In Africa, it is estimated that 91.5 million girls and women above the age of 9 have been affected by FGM (Yoder and Khan, 2008). FGM has no health benefits and can be harmful to girls and women. According to the World Health Organization (WHO, 2008), FGM can cause immediate complications such as severe bleeding and problems urinating and long-term complication with childbirth.

The age in which FGM is performed varies across cultures but the procedure is generally done when girls are between the ages of 0 and 15 years (WHO, 2008). The type of procedure performed differs mainly among ethnicities within a country. WHO classified these procedures into four main types:

- Type I (clitoridectomy): Partial or total removal of the clitoris

- Type II (excision): Partial or total removal of the clitoris and the labia minora, with or without the excision of the labia.
- Type III (infibulation): Narrowing the vaginal opening by cutting and repositioning the labia minora, or labia through stitching.
- Type IV: This includes all other harmful female genital procedures for non-medical purposes, such as pricking, piercing, incising, scraping and cauterizing.

Current estimates from national surveys show that Types I, II, or IV are most commonly performed (UNICEF, 2013). Type III is the most severe form and is practiced predominantly among Northern Sudanese and Djibouti women (Nour, 2008). Midwives or trained circumcisers from the communities perform the practice and sometimes without proper medical instruments, anesthesia, antibiotics, or sterile techniques (Nour, 2008). The reasons for continuing the practice differ among cultures and ethnicities, however the commonly cited reasons include "rite of passage, preserving chastity, ensuring marriageability, religion, hygiene, improving fertility, and enhancing sexual pleasure for men" (Nour, 2008).

The origin and historical background of female genital mutilation remains unknown. It is believed that FGM began in Africa during the fifth century B.C and was practiced in ancient Egypt, ancient Rome, Arabia, and Tsarist Russia (Little, 2003). In present times, FGM has become a worldwide public health issue due to being popular in 28 countries in Africa, some countries in Asia and the Middle East, and immigrant communities in North America and Europe (WHO, 2010).

1.2. Purpose of the Study

Studies have documented the physiological complications associated with FGM, however there is a lack of substantive scientific data that describes the effects of FGM on sexual behavior and marriageability. FGM is used as tool to control female sexuality, therefore, one would expect a significant difference in sexual behavior between women who are circumcised or not. This study seeks to investigate if FGM is significantly associated with sexual behaviors and marriageability in Ethiopia. The data would be useful to plan appropriate interventions to further reduce the practice of FGM in all regions of the country.

1.3. Hypotheses

Hypothesis 1

After adjusting for sociodemographic factors, women have been circumcised are less likely to have more than 1 lifetime sexual partner than uncircumcised women.

Hypothesis 2

After adjusting for sociodemographic factors, women who have been circumcised are less likely to have an early sexual debut before age 15 than uncircumcised women.

Hypothesis 3

After adjusting for sociodemographic factors, women who have been circumcised are less likely to have premarital sex than uncircumcised women.

CHAPTER II

REVIEW OF THE LITERATURE

The literature review examined social and cultural factors for performing FGM. The reasoning for the continuation of FGM among cultures varies however these factors include that the practice is a rite of passage, a religious requirement, increases marriageability, prevents sexual promiscuity, and preserves virginity (Okonofua et al., 2002). Even though this argument infringes upon the rights of women, these beliefs are held by traditional defenders to continue and promote the practice throughout communities.

2.1 Sociocultural factors for performing FGM

2.1.1. Prevents sexual promiscuity

It is believed that FGM prevents sexual promiscuity until marriage which thereby enhances marriageability. Mpofu et. al studied the association between FGM and sexual behavior in Kenya and Nigeria using the 2008 to 2009 Kenya Demographic and Health Survey and the 2008 Nigeria Demographic Health Survey. This study measured sexual behavior by age at first intercourse and total lifetime number of sexual partners. In Kenya and Nigeria, the multivariate analyses showed that circumcision was not significantly related to sexual initiation or the total number of lifetime partners. If the notion that circumcised women practice sexual restraint in comparison to uncircumcised women results would have shown that circumcised women waited to engage in sexual activity and had fewer number of sexual partners. However, FGM did not show any difference in sexual behavior among women from Kenya and Nigeria.

2.1.2. Enhances marriageability

In some societies FGM is used to define a woman's identity and social status which affects a woman's marriageability. The belief is that a woman's marriage chances are determined by one's behavior such has "upholding strict modesty and chastity codes" which is thought to ensure marriageability of girls (Rossem et.al., 2009). A circumcised woman is considered in "good standing" within her community while uncircumcised woman have a lower status (Rossem et.al., 2009). Therefore, a woman's social status and circumcision status determines her marriageability. Roosem et al. found that the belief that FGM helps with marriageability was more widely shared among men and a minority of women at 41.3% and 27.5%, respectively. These findings suggest that control over a female sexuality may not be the only reason for continuing FGM in different communities. After controlling for sociodemographic factors the hazard rate for first marriage was not statistically different among those who were not circumcised in comparison to FGM types (I, II, III, IV). If the idea that FGM controls the sexual desire and pleasure of women, one would expect circumcised women to marry earlier than uncircumcised women. However, this study did not show that FGM in Guinea did not affect the marriageability of women.

2.1.3. Prevents premarital sex

A claim often made in support of FGM is that it protects virginity until marriage. A family's status is judged based on members behaviors. Inappropriate sexual behavior by women in communities can damage a family status, therefore one strategy to control female sexuality is through the practice of FGM (Rossem et al., 2009). Rossem et al. examined such claims, as the effects of FGM on the onset of sexual activity and marriage in Guinea using the 1999 Guinea Demographic and Health Survey. Among circumcised Guinean women and men 17.1% and

15.9%, respectively, believed that FGM reduces the risk of premarital sex. After controlling for the sociodemographic characteristics, the effect of FGM on premarital sex was not statistically significant.

2.1.4. Religious requirement

FGM is often assumed to be associated Islam given the number of Muslim women in Africa subjected to this practice (UNICEF, 2013). However, FGM is also practiced among groups of Christians and Ethiopian Jews (El-Damanhoury, 2013). There are countries such as Niger, Nigeria, and Tanzania where the prevalence of FGM is greater among Christian groups (UNICEF, 2013). The practice of FGM predates both Islam and Christianity and cannot be found or justified in any of the religious texts among the three monotheistic religions (El-Damanhoury, 2013). Nonetheless, the belief that FGM is a religious requirement is often connected to social norms and tradition giving women a sense of ethnic and Islamic identity (UNICEF, 2013). According to the 2016 Ethiopian Demographic and Health Survey (EDHS), 24% of women who have heard of female circumcision believe that it is a requirement by their religion. However, this opinion varies among different parts of Ethiopia, with 62% of women in the Affar and 6% in Addis Ababa regions believing that circumcision is required by religion.

CHAPTER III

MANUSCRIPT

1. Introduction

Although, the prevalence of FGM is decreasing across national levels, the regional numbers show that prevalence is still high and has not changed. Ethiopia was selected for this study due to the high prevalence numbers of female genital mutilation at the national level and regional levels. In Ethiopia, according to the 2016 Demographic and Health Survey, the prevalence of women and girls, aged 15-49, have experienced FGM 65.2% which has decreased from 74.3% in 2005. However, across regions in Ethiopia FGM ranges from 24.2% in the Tigray region to 98.5% in the Somali region (2016 EDHS). The practice still persists even though Ethiopia passed legislation criminalizing the practice and banning the medicalization of FGM. The practice is used to control female sexuality to increase the chances of marriage. (Okonofua et al., 2002). In Ethiopia, FGM is used to maintain female virginity and sexual chastity which are prerequisite for marriage (Missailidis et al., 2000). Therefore, this study assessed the association of FGM on sexual behaviors and marriageability in Ethiopia.

2. Methods and Procedures

2.1. Data Source

This study used secondary data from the 2016 Ethiopia Demographic and Health Survey (2016 EDHS). The survey was conducted by the Central Statistical Agency (CSA) along with the Federal Ministry of Health (FMoH) and the Ethiopian Public Health Institute (EPHI) from January 18, 2016 to June 27, 2016. The data were obtained from the United States Agency for

International Development (USAID) funded DHS program, website which granted access after the purpose of the study was explained. The survey is a nationally representative sample that randomly selects households in Ethiopia and provides detailed information and estimates on the following: "background characteristics of respondents, fertility, marriage, fertility preferences, awareness and the use of family planning methods, child feeding practices, nutritional status of women and children, adult and childhood mortality, awareness and attitudes of HIV/AIDS, female genital mutilation and domestic violence" (2016 EDHS).

The 2016 EDHS was designed to provide estimates at the national, regional, and district levels. The 2007 Ethiopia Population and Housing was used as a sampling frame. The sample was selected using a stratified two-stage cluster design. The first stage selected 202 urban and 443 rural clusters. The second stage selected 28 household per cluster. The number of eligible participants interviewed in the survey were 15,683 women age 15 to 49 and 12,688 men age 15-59 from 16,650 households.

2.2. Study Design and study sample

A cross-sectional study design was used to examine the association with sexual behaviors and marriageability in Ethiopia that interviewed 15,683 women. The sample size of the study's population included 7,151 women between the ages of 15 to 49 who responded "yes" when asked if they ever heard of female genital mutilation/cutting during the survey were included in the study. Those responding yes were then asked if they had been circumcised. Participants who had missing information for the following variables were excluded: education level, place of residence, wealth index, age, region, religion, ethnicity, religion, circumcision status, age at first intercourse, age at first sexual intercourse, age at first marriage or union and total lifetime number of sexual partners.

2.3. Variables of Interest

Dependent Variables: Sexual behavior and marriageability were measured using these dependent variables: multiple lifetime number of sexual partners, early sexual debut and premarital sex. Multiple lifetime number of sexual partners was dichotomized as "more than 1" being "yes" and "less than or equal to 1" being "no." According to WHO (2004), sexual initiation before age 15 is considered early sexual debut. Therefore early sexual debut was dichotomized as sexual debut before age 15 being "yes" and sexual debut at or after age 15 as "no". Marriageability was measured by premarital sex which is based on previous literature stating that in Ethiopia female virginity is a prerequisite for marriage and FGM ensures this (Missailidis et al. 2000). In this study premarital sex was defined as participant's whose age at first intercourse was lower than the age at first marriage/union. Therefore, if age of first intercourse was the same as age at first marriage the participant was defined as not having premarital sex. All categorical variables whether independent or dependent were coded as "0" for no and "1" for yes.

Independent Variables: The main independent variable for this study was FGM. The control variables included sociodemographic characteristics that were known to have been associated with FGM, sexual behavior, and marriageability of women (UNICEF 2013; Rossem et al., 2009; Mpofu et al., 2016). The following variables were included in the analyses to assess unbiased associations:

AGE: Participants' age were reported in years at the time of the interview. Based on previous studies, age was recoded and categorized into these ages groups 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, and 45-49.

EDUCATION: Highest level of education attained was categorized as no education, primary, secondary, or more than secondary.

RELIGION: Religion was self-reported and categorized, for this study, as Orthodox, Catholic, Protestant, Muslim, Traditional, or other.

ETHNICITY: Self-reported ethnic groups, for this study, were categorized as Affar, Amhara, Guragie, Hadiya, Oromo, Sidama, Somali, Tigray, Welaita, and others

RESIDENCE: The type of place of residence refers to where the participant was interviewed as urban or rural.

REGION: Region of residence refers to where the participant was interviewed. The nine regions and 2 administrative cities include: Tigray, Affar, Amhara, Oromiya, Somali, Benishangul-Gumuz, SNNPR, Gambela, Harari, Addis Ababa, and Dire Dawa.

WEALTH INDEX: Wealth is determined by scoring a household's cumulative living standard and various assets such as televisions and types of water access. First, households are ranked from lowest to highest and then separated into these quintiles.

2.4. Data analysis

Statistical Analysis System (SAS) version 9.4 was used to analyze the data. Descriptive statistics were obtained for the independent and dependent variables. Bivariate and multivariate analysis were performed to examine association between independent and dependent variables. Logistic regression was used to analyze multiple lifetime sexual partners, early sexual debut, and premarital sex to determine odds ratios (OR) and 95% confidence intervals (CI).

3. Results

3.1 Characteristics and Distribution of the Study Sample

After excluding respondents who did not meet the inclusion criteria, the study sample size included 7,151 women between the ages of 15 and 49. Table 1 shows the distribution of the respondents by the selected demographic characteristics. Women between 15 to 19 years old represented 20.8 percent of the sample, while those in the 45 to 49 age group were only 6.9 percent. The majority of the study participants had either no education (46.7%) or primary schooling (34.7%). Over half (65%) of the women were married or living with a partner while 25% were never married. Most of the respondents belonged to the Christian denomination groups, Orthodox (43.7%) and Protestant (23.1%), while the remaining were Muslim (31.5%), Catholic (0.7%), Traditional (.8%), and other religions (.3%) practiced in Ethiopia. As for ethnic groups, 35.5% of respondents identified as Oromo and 30.5 % were Amhara. Many of the respondents lived in rural areas (77%). Regions with the highest proportion of participants included: Oromia (37.7%), Amhara (23.5%), and SNPR (19.9%). In this study, most of the women were in the rich quintile (47.3%). As for the prevalence of circumcision, 70.8% of women responded yes to being circumcised. In this study, majority of the women had less than or only 1 lifetime number of sexual partners (59%) whereas 18.4% had multiple sexual partners As for early sexual debut, 39.8% of respondents reported that their sexual debut was not before age 15 and 54.9% did not have premarital sex.

3.2. Descriptive analysis

Table 2 shows results of the chi-square test to determine the association of uncircumcised and circumcised women by background characteristics. There was a statistically significant greater proportion of circumcised women who did not have multiple lifetime number of partners, premarital sex, or a sexual debut before age 15. Also, there was a significant difference between uncircumcised and circumcised women based on age groups, education, marital status, religion,

ethnicity, place of residence, region of residence, and wealth index. Majority of uncircumcised women were 15 to 19 years old, educated, rich, married/living with a partner, Orthodox, Amhara, live in rural areas, and in the Amhara region. However many circumcised women were rich, 25 to 29 years old, non-educated, married/living with a partner, Muslim, Oromo, live in rural areas, and in the Oromia region.

The sexual behaviors of study subjects included whether they had multiple lifetime number of sexual partners and if they had an early sexual debut. In Table 3, the chi-square test showed that age groups, education, marital status, religion, ethnicity, residence, region, circumcision status, and premarital sex were significantly different among lifetime number of partners and age at sexual debut. Women who had multiple lifetime number of sexual partners were circumcised (72%), 35 to 39 years old (21%), rich (46%), non-educated (65%), married/living with a partner (75%), Orthodox Christian (60%), Amhara (55%), lived in rural areas (75%), and in the Amhara region (41%), and did not have premarital sex (62%). Women who had an early sexual debut were mostly circumcised (63%), did not engage in premarital sex (68%), rich (50%), 15 to 19 years old (43%), primary educated (41%), never married (57%), Orthodox Christian (49%), Amhara (39%), live in rural areas (76%), and in the Oromia region (33%). However, wealth index did not show a significant difference by lifetime number of sexual partners while comparing age at sexual debut did show a significant difference. In Table 4, the chi-square test showed that age, education, religion, ethnicity, residence, region, wealth index, multiple lifetime number of sexual partners, and early sexual debut were significantly different among those who did or did not have premarital sex. Study subjects who did have premarital sex were mainly circumcised (74%), did not have multiple lifetime number of sexual partners (66%), did not have an early sexual debut (73%), 25 to 29 years old (21%), non-educated (58%),

married/ living with a partner (87%), Orthodox Christian (49%), Amhara (38%), live in rural areas (76%) and in the Oromia region (38%).

3.3 Bivariate logistic analyses

Tables 5 and 6 show the results of the unadjusted odds ratio between the independent variables and the main outcome variables. In Table 5, the results from the bivariate logistic regression showed significant associations between multiple lifetime number of sexual partners and the following background characteristics: age, education, marital status, religion, ethnicity, place of residence, place of region, circumcision status, and premarital sex to be significant. All age groups had a significantly higher risk of having multiple lifetime number of sexual partners. Non-educated women had an increased risk (OR=1.36, 95% CI: 1.03-1.80) of having multiple lifetime number of sexual partners. When examining marital status, women who were divorced/separated/widowed were found to be more likely to have multiple lifetime number of sexual partners(OR=2.40, 95% CI: 1.57-3.69). Women who practiced traditional religions were found to have a decreased risk (OR=.001, 95% CI: <.001-.020) of multiple lifetime number of sexual partners. Among ethnic groups, Amhara, Tigray, and Guragie were more likely to have multiple lifetime number of sexual partners in comparison to Affar and Somali groups. Women who live in rural areas had an increased risk (OR=1.43, 95% CI: 1.12-1.84) in comparison to those living in rural areas. Also, women from the regions of Tigray, Afar, Amhara, Oromia, Benishangula, Gambela, Addis Ababa, and Dire Dawa had a greater likelihood of having multiple lifetime number of sexual partners. The odds of multiple lifetime number of sexual partners among circumcised women was .752 times the odds of hypertension among uncircumcised women.

In Table 5, results showed that there were significant associations between early sexual debut and the following background characteristics: age, education, marital status, religion, ethnicity, residence, region, wealth index, circumcised, and premarital sex. Women with multiple lifetime number of sexual partners were significantly more likely to be 40 to 44 years old (OR=5.78, 95% CI: 3.37-9.92), no education (OR=1.36, 95% CI: 1.03-1.80) , divorced/separated/widowed (OR=2.4 , 95% CI: 1.57-3.69), Amhara (OR= 3.29 ,95% CI: 2.51-4.32), live in rural areas (OR= 1.43 ,95% CI: 1.12-1.84), and in the Amhara region (OR= 5.94, 95% CI: 3.94-8.96). However, women who have multiple lifetime number of women were less likely to be circumcised (OR=.752, 95% CI: .605-936). Women with an early sexual debut were significantly more likely to be between the ages 15 to 24. Having an education, being never married, and practicing Orthodox Christianity had an increased risk of sexual debut before age 15. Among ethnic groups, women belonging to either Amhara or Tigray were significantly more likely to have an early sexual debut. Among circumcised women, sexual debut significantly decreased (OR=.54, 95% CI: .446-.643).

Table 6 shows the results of the bivariate logistic regression that was conducted to analyze the relationship for FGM and background characteristics associated with premarital sex. In this study, women of all age groups were significantly more likely to have premarital sex. The risk of premarital sex significantly increased among women having a secondary or higher education level, being Orthodox Christian, living in urban areas, or in the regions of Tigray, Amhara, Gambela, Harari, and Addis Ababa, and being average or rich. However, among circumcised women there was a significant decrease in risk (OR=.822, 95% CI: .659-1.03) of having premarital sex.

3.4 Multivariate logistic analyses

In Tables 7 and 8, three multivariable logistic regression models were used to assess the independent relationship between the independent variables and the dependent variables. The first model was measuring the relationship of the covariates and FGM on multiple lifetime number of sexual partners. After adjusting for covariates the odds of multiple lifetime numbers of sexual partners among circumcised women was .75 times the odds of multiple lifetime number of sexual partners among uncircumcised women. Women with no education were significantly more likely (OR=1.36, 95% CI: 1.03-1.80) to have multiple number of lifetime sexual partners. In terms of ethnic groups, Amhara and Tigray are significantly more likely to have multiple lifetime sexual partners in comparison to Somali, Sidama, and Hadiya which were significantly less likely. Though nonsignificant married women were less likely to have multiple lifetime number of partners than married women. Also, average or rich women were less likely to have multiple lifetime number of sexual partners than poor women (nonsignificant).

Another multivariable logistic model was created to examine the independent effects of the covariates and FGM on early sexual debut. Although nonsignificant circumcised women were less likely to have an early sexual debut. The findings suggests that FGM is protective for multiple partners (significant) and also for early sexual debut (nonsignificant). Also, the results showed that women with an early sexual debut were significantly more likely to be ages 15 to 19, Orthodox Christian, Amhara or Sidama, live in the regions of Tigray, Afar, Amhara, Benishangula, SNPR, and Gambela. However, women with an education or living in urban areas were less likely to have an early sexual debut.

Table 8 shows the results of the third multivariable logistic model used to show

the relationship of covariates and FGM on premarital sex among married women. FGM is protective against premarital sex among married women but again, nonsignificant. After adjusting for the covariates, the results reveal that age, practicing Orthodox Christianity and living in Addis Ababa were significantly associated with premarital sex.

4. Discussion and Conclusion

4.1. Discussion

FGM has become a global issue with the practice violating the rights of girls and women. The practice is used as a tool to control female sexuality with the belief that it will make them more marriageable. As with many countries in Africa, FGM is commonly practiced in Ethiopia. The purpose of this study was to examine the relationship between FGM in sexual behaviors and marriageability in Ethiopia. This is based on the belief that FGM controls a woman's sexual desire which will preserve virginity before marriage. The hypotheses reflect common beliefs among cultures that practice FGM and in general were not borne out of this study. The sexual behaviors assessed in this study were lifetime number of sexual partners and age at sexual initiation. Based on previous literature, marriageability was measured by premarital sex stating that in Ethiopia female virginity is a prerequisite for marriage and FGM ensures this (Missailidis et al. 2000). If this belief were true, one would expect to find that circumcised women were significantly more likely to have fewer number of sexual partners, a delay in sexual debut, and not to engage in premarital sex.

In this study, the prevalence of circumcised women in Ethiopia was 71%. The results revealed after adjusting for age, education level, wealth index, religion, marital status, ethnicity, place of residence and region that circumcision was not significantly associated with an early

sexual debut and premarital sex. However, in every model, FGM was protective against multiple lifetime number of sexual partners, early sexual debut, and premarital sex but only significant for multiple lifetime number of sexual partners. Although, FGM was shown to be protective of a women's sexual behavior, depending on the type of circumcision done such as Type III which is infibulation, are less likely to engage in sexual intercourse often which may have an effect on the results. (Yount & Abraham, 2007). Since sexual behavior is a sensitive topic, women may under-report their sexual activities based on social norms.

However, previous studies have found that FGM had no effect on sexual behaviors or marriageability. Mpofu et al. (2016) found that circumcision was not related to the age at sexual initiation or the number of lifetime sexual partners in both Kenya and Nigeria. Circumcision did not make a significant difference on the sexual behaviors of women from both countries. In another study by Rossem and Gage (2009) who studied the effects of FGM age at sexual initiation and marriage in Guinea. After adjusting for sociodemographic characteristics the results had similar findings, no significant relationship could be found between the type of FGM that was done, and age at first marriage and risk of premarital sex. Similar to the previous study, any findings that showed a relationship between FGM and sexual behaviors and premarital sex were due to sociodemographic factors.

When examining the role sociodemographic variables had on this study, results showed that age, education, religion, ethnicity, place of residence, and region were associated with the sexual behaviors. Because, more women in rural areas were circumcised, one would expect to see a later sexual debut based on the belief that FGM controls sexual behavior. However, women with no education or in rural areas were significantly more likely to have an early sexual debut

before age 15. This can possibly be attributed to girls who have no education, live in rural areas, and poor tend marry significantly earlier (CSA and ICF International,2012).

4.2. Study limitations

Limitations within this study need to be considered when interpreting the results. One limitation of this study is that the data from DHS is self-reported which can lead to the possibility of recall bias. For example, in rural areas of Ethiopia, many do not know their exact age or birthdate leading them to guess or estimate their age. Another limitation to consider is that when discussing sexual behavior, which is a sensitive topic, participants mainly women may under-report the number of sexual partners, age at sexual debut, and if they had premarital sex due to social stigma. Some communities do not openly talk about sexual activity, especially, areas with a high prevalence of FGM where discussing such topics are considered out of the norm for women.

4.3. Implication of Findings

Although, the results showed that FGM decreased the risk of having multiple number of sexual partners, early sexual debut and premarital sex these findings suggest that these women may be following gender roles and social norms that may be decreasing their likelihood of having multiple number of sexual partners, early sexual debut and premarital sex. The prevalence of FGM has been declining at a national level but regional levels have remained high. Using these results, more programs and strategies need to be specific to regions and ethnicities with a high prevalence of FGM instead of applying national strategies to every region. Rossem and Gage (2009) explained that rather than challenging existing traditions to instead "build upon existing traditions, community values, and social roles" and change some of the elements

without completely getting rid of the whole structure to provide a culturally acceptable alternative that will not cause physical harm to women.

4.4. Conclusion

This study showed that FGM did not control all sexual behaviors or marriageability. Therefore, refuting the argument and foundation of the practice of FGM being effective at controlling female sexuality. Although, the hypothesis that circumcised women were less likely to have more than 1 sexual partner was supported in the results, the other hypotheses were not. There was no significant difference based on early sexual debut and premarital sex. The results of this study suggest a need at having specific interventions and education on FGM for younger women, women living in rural areas, and poor women.. The study shows that further research is needed to show the effects of the different types of circumcision has on controlling female sexuality.

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Appendices

Table 1: Characteristics of study participants among 7,151 women who knew about FGM

Characteristics	n (7,151)	Percentage (%)
Circumcised		
No	2087	29.18
Yes	5064	70.82
Age groups		
15-19	1488	20.80
20-24	1183	16.54
25-29	1341	18.75
30-34	1116	15.60
35-39	928	12.99
40-44	600	8.39
45-49	495	6.93
Highest level of education		
No Education	3340	46.71
Primary	2480	34.67
Secondary or Higher	1331	18.62
Marital Status		
Never married	1800	25.17
Married/living with partner	4651	65.04
Divorced/Separated/Widowed	700	9.79
Religion		
Orthodox	3124	43.69
Catholic	49	0.692
Protestant	1651	23.08
Muslim	2252	31.48
Traditional	55	.769
Others	20	.281
Ethnicity		
Amhara	2182	30.52
Oromo	2536	35.46
Tigray	478	6.69
Affar	55	.768
Somali	219	3.06
Guragie	201	2.81
Sidama	319	4.47
Welaita	228	3.19
Hadiya	180	2.51
Others	140	1.96
Missing	613	8.57

Table 1: Characteristics of study participants among 7,151 women who knew about FGM (continued)

Characteristics	n (7,151)	Percentage (%)
Residence		
Urban	1651	23.09
Rural	5500	76.91
Region		
Tigray	451	6.30
Afar	67	.930
Amhara	1682	23.52
Oromia	2694	37.67
Somali	227	3.18
Benishangula	67	0.943
SNPR	1425	19.93
Gambela	15	0.209
Harari	18	.253
Addis Adaba	460	6.44
Dire Dawa	45	.634
Wealth Index		
Poor	2364	33.06
Average	1401	19.59
Rich	3386	47.34
Total lifetime number of sex partners		
≤1	4216	58.95
>1	1313	18.36
Missing	1622	22.69
Sexual debut before 15		
No	4306	60.22
Yes	2845	39.78
Premarital sex		
No	3927	54.91
Yes	1424	19.92
Missing	1800	25.17

Table 2: Characteristics of study participants according to circumcision status

Characteristics	Uncircumcised		Circumcised		P-Value*
	n	%	n	%	
Age groups					<.0001**
15-19	709	33.96	779	15.38	
20-24	427	20.47	756	14.92	
25-29	354	16.99	987	19.48	
30-34	199	9.54	917	18.10	
35-39	180	8.62	749	14.79	
40-44	131	6.27	469	9.26	
45-49	87	4.15	409	8.08	
Highest level of education					<.0001**
No Education	613	29.36	2728	53.86	
Primary	819	39.23	1661	32.80	
Secondary or Higher	655	31.40	676	13.35	
Marital Status					<.0001**
Never married	867	41.53	934	18.43	
Married/living together	1043	50.00	3608	71.24	
Divorced/Separated/Widowed	177	8.47	523	10.33	
Religion					<.0001**
Orthodox	1271	60.93	1853	36.59	
Catholic	11	.521	39	.762	
Protestant	429	20.56	1222	24.12	
Muslim	339	16.25	1912	37.76	
Traditional	21	.998	34	.675	
Others	15	.741	5	.091	
Ethnicity					<.0001**
Amhara	776	37.18	1406	27.77	
Oromo	493	23.61	2043	40.35	
Tigray	349	16.72	129	2.55	
Affar	1	.042	54	1.07	
Somali	3	.136	215	4.26	
Guragie	40	1.94	160	3.16	
Sidama	38	1.82	281	5.55	
Welaita	12	.572	216	4.26	
Hadiya	120	.480	170	3.35	
Others	70	3.33	71	1.40	
Missing	296	14.18	317	6.26	
Residence					<.0001**
Urban	732	35.09	919	18.15	
Rural	1355	64.91	4145	81.85	

Table 2: Table 2: Characteristics of study participants according to circumcision status (continued)

Characteristics	Uncircumcised		Circumcised		P-Value
	n	%	n	%	
Region					<.0001**
Tigray	320	15.36	130	2.57	
Afar	6	.282	61	1.19	
Amhara	557	26.70	1124	22.20	
Oromia	548	26.26	2146	42.37	
Somali	3	.138	224	4.43	
Benishangula	21	.980	47	.928	
SNPR	401	19.22	1024	20.22	
Gambela	8	.371	7	.143	
Harari	3	.151	15	.296	
Addis Adaba	210	10.05	251	4.95	
Dire Dawa	10	.489	35	.693	
Wealth index					<.0001**
Poor	597	28.62	1767	34.89	
Average	317	15.18	1084	21.41	
Rich	1173	56.20	2213	43.69	
Total lifetime number of sex partners					.0100**
≤1	938	44.94	3278	64.73	
>1	362	17.33	951	18.78	
Missing	787	37.73	835	16.49	
Sexual debut before age 15					<.0001**
No	1032	49.47	3274	64.65	
Yes	1054	50.53	1790	35.35	
Premarital sex					<.0001**
No	859	41.14	3068	60.58	
Yes	362	17.33	1063	20.98	
Missing	867	41.53	934	18.43	

*Pearson chi-square test for comparison of proportion

**Significant values, $P < .05$

Table 3: Characteristics of study participants by multiple lifetime number of sexual partners and early sexual debut

Characteristics	Multiple lifetime number of sex partners		P-Value*	Early sexual debut		P-Value*
	Yes(%)	No(%)		Yes (%)	No (%)	
Circumcised			.0100**			<.0001**
No	27.55	22.24		37.06	23.97	
Yes	72.45	77.76		62.94	76.03	
Age groups			<.0001**			<.0001**
15-19	2.71	7.74		42.92	6.19	
20-24	10.52	16.82		16.40	16.63	
25-29	15.70	24.41		11.40	23.61	
30-34	19.50	19.71		9.66	19.53	
35-39	20.48	15.21		8.10	16.22	
40-44	17.48	8.64		6.18	9.85	
45-49	13.61	7.47		5.34	7.98	
Highest level of education			.002**			<.0001**
No Education	64.58	56.02		35.74	53.96	
Primary	24.09	30.61		40.72	30.68	
Secondary or Higher	11.33	13.37		23.54	15.36	
Marital Status			<.0001**			<.0001**
Never married	3.26	3.46		57.37	3.90	
Married/living together	74.89	86.90		36.16	84.12	
Divorced/Separated/Widowed	21.85	9.64		6.47	11.98	
Religion			<.0001**			<.0001**
Orthodox	60.34	37.28		48.97	40.20	
Catholic	.322	.744		.719	.674	
Protestant	14.02	23.77		22.23	23.65	
Muslim	24.81	36.74		27.25	34.28	
Traditional	.0007	1.18		.620	.868	
Others	.510	.290		.205	.331	
Ethnicity			<.0001**			<.0001**
Amhara	54.90	26.94		38.91	29.65	
Oromo	27.22	43.93		33.78	42.16	
Tigray	9.43	6.52		7.64	7.10	
Affar	.415	1.11		.618	.990	
Somali	1.45	3.99		2.69	3.79	
Guragie	1.92	2.88		3.09	3.06	
Sidama	1.41	6.11		4.88	4.89	
Welaita	1.53	3.29		3.74	3.31	
Hadiya	.154	3.00		3.02	2.57	
Others	1.58	2.22		1.65	2.48	

Table 3: Characteristics of study participants by multiple lifetime number of sexual partners and early sexual debut (continued)

Characteristics	Multiple lifetime number of sex partners		P-Value*	Early sexual debut		P-Value*
	Yes(%)	No(%)		Yes (%)	No (%)	
Residence			.0047**			
Urban	25.20	19.03		24.15	22.39	
Rural	74.80	80.97		75.85	77.61	
Region			<.0001**			<.0001**
Tigray	8.77	5.51		6.80	5.97	
Afar	0.717	1.13		.754	1.05	
Amhara	40.91	19.10		28.95	19.92	
Oromia	27.35	43.02		32.81	40.88	
Somali	1.38	3.82		2.53	3.60	
Benishangula	.853	1.05		.798	1.04	
SNPR	11.11	21.02		19.31	20.33	
Gambela	.326	.201		.194	.220	
Harari	.166	.293		.202	.287	
Addis Adaba	7.88	4.25		7.08	6.02	
Dire Dawa	.546	.619		.566	.678	
Wealth index			.3911			.0152**
Poor	34.64	36.67		30.40	34.82	
Average	18.94	20.36		19.45	19.69	
Rich	46.42	42.97		50.15	45.49	
Premarital sex			<.0001**			.0089**
No	61.60	77.19		68.24	74.89	
Yes	38.40	22.81		31.76	25.11	

*Pearson chi-square test for comparison of proportion

**Significant values, P< .05

Table 4: Characteristics of study participants by premarital sex

Characteristics	Premarital sex		P-Value*
	Yes(%)	No(%)	
Circumcised			.0822
No	25.39	21.87	
Yes	74.61	78.13	
Age groups			<.0001**
15-19	2.91	7.40	
20-24	13.52	15.23	
25-29	21.39	22.32	
30-34	20.99	19.73	
35-39	20.53	15.39	
40-44	9.56	11.43	
45-49	11.10	8.49	
Highest level of education			.0319**
No Education	58.16	60.40	
Primary	27.26	29.08	
Secondary or Higher	14.59	10.52	
Marital Status			.8018
Never married	NA	NA	
Married/living together	86.63	87.03	
Divorced/Separated/Widowed	13.37	12.97	
Religion			.0001**
Orthodox	49.27	39.04	
Catholic	.964	.554	
Protestant	17.28	23.08	
Muslim	31.84	35.81	
Traditional	.514	1.08	
Others	.135	.433	
Ethnicity			.0006**
Amhara	38.42	31.42	
Oromo	38.75	41.03	
Tigray	7.87	6.69	
Affar	.423	1.17	
Somali	2.77	3.75	
Guragie	2.53	2.35	
Sidama	2.45	6.03	
Welaita	2.71	2.91	
Hadiya	2.38	2.39	
Others	1.70	2.26	
Residence			.0004**
Urban	24.01	17.14	
Rural	75.99	82.86	

Table 4: Characteristics of study participants by premarital sex (continued)

Characteristics	Premarital Sex		P-Value*
	Yes(%)	No(%)	
Region			<.0001**
Tigray	7.00	5.99	
Afar	.588	1.21	
Amhara	27.50	23.30	
Oromia	37.60	40.83	
Somali	2.80	3.53	
Benishangula	.976	1.01	
SNPR	14.92	20.41	
Gambela	.260	.206	
Harari	.321	.241	
Addis Adaba	7.45	2.71	
Dire Dawa	.601	.566	
Wealth index			.0076**
Poor	32.89	38,33	
Average	18.92	21.22	
Rich	48.19	40.45	
Multiple lifetime sex partners			<.0001**
No	65.56	80.06	
Yes	34.44	19.94	
Early sexual debut			.0089**
No	72.96	78.92	
Yes	27.04	21.08	

*Pearson chi-square test for comparison of proportion

**Significant values, $P < .05$

Table 5: Bivariate analysis for circumcision and sociodemographic characteristics associated with multiple lifetime number of sexual partners and early sexual debut

Characteristics	Multiple lifetime number of sexual partners		Early sexual debut	
	OR	95% CI	OR	95% CI
Circumcised				
No	1.00	referent	1.00	referent
Yes	.752	(.605-.936)*	.535	(.446-.643)*
Age groups				
15-19	1.00	referent	14.03	(10.3-19.2)*
20-24	1.79	(1.03-3.10)*	2.00	(1.49-2.68)*
25-29	1.84	(1.06-3.18)*	.976	(.730-1.31)
30-34	2.84	(1.66-4.82)*	1.00	Referent
35-39	3.85	(2.28-6.50)*	1.01	(.737-1.38)
40-44	5.78	(3.37-9.92)*	1.27	(.906-1.78)
45-49	5.21	(2.97-9.12)*	1.35	(.917-2.00)
Highest level of education				
Secondary or higher	1.00	referent	2.31	(1.91- 2.80)*
Primary	.928	(.658-1.31)	2.00	(1.68-2.39)*
No Education	1.36	(1.03-1.80)*	1.00	referent
Marital Status				
Never married	1.00	referent	34.18	(26.9-43.4)*
Married/living together	.914	(.622-1.34)	1.00	referent
Divorced/Separated/Widowed	2.40	(1.57-3.69)*	1.26	(.960-1.64)
Religion				
Catholic	1.00	referent	1.34	(.491-3.66)
Orthodox	3.74	(1.00-13.94)	1.53	(1.28-1.84)*
Protestant	1.36	(.359-5.17)	1.18	(.964-1.45)
Muslim	1.56	(.409-5.94)	1.00	Referent
Traditional	.001	(<.001-.020)*	.898	(.610-1.32)
Others	4.06	(.621-26.57)	.780	(.215-2.83)
Ethnicity				
Oromo	1.00	referent	1.00	referent
Amhara	3.29	(2.51-4.32)*	1.64	(1.32-2.04)*
Tigray	2.33	(1.68-3.23)*	1.34	(1.07-1.70)*
Affar	.606	(.383-.958)*	.779	(.540-1.12)
Somali	.586	(.384-.958)*	.886	(.667-1.18)
Guragie	1.08	(.663-1.74)	1.26	(.904-1.76)
Sidama	.373	(.160-.870)*	1.25	(.839-1.85)
Welaita	.752	(.392-1.44)*	1.41	(.704-2.83)
Hadiya	.083	(.013-.516)*	1.46	(.715-2.99)
Others	1.15	(.596-2.21)	.830	(.474-1.45)

Table 5: Bivariate analysis for circumcision and sociodemographic characteristics associated with multiple lifetime number of sexual partners and early sexual debut (continued)

Characteristics	Multiple lifetime number of sexual partners		Early sexual debut	
	OR	95% CI	OR	95% CI
Residence				
Rural	1.00	referent	1.00	referent
Urban	1.43	(1.12-1.84)*	1.10	(.936-1.30)*
Region				
Somali	1.00	referent	1.00	referent
Tigray	4.41	(2.86-6.80)*	1.62	(1.23-2.14)*
Afar	1.77	(1.10-2.85)*	1.03	(.760-1.39)
Amhara	5.94	(3.94-8.96)*	2.07	(1.58-2.70)*
Oromia	1.76	(1.14-2.73)*	1.14	(.868-1.50)
Benishangula	2.26	(1.29-3.97)*	1.09	(.800-1.49)
SNPR	1.47	(.922-2.33)	1.35	(1.02-1.80)*
Gambela	4.50	(2.84-7.13)*	1.26	(.885-1.79)
Harari	1.58	(.940-2.64)	1.001	(.711-1.41)
Addis Ababa	5.14	(3.40-7.80)*	1.67	(1.29-2.18)*
Dire Dawa	2.45	(1.49-4.01)*	1.19	(.862-1.63)
Wealth index				
Poor	1.00	referent	1.00	referent
Average	.984	(.742-1.31)	1.13	(.925-1.38)
Rich	1.14	(.906-1.44)	1.26	(1.08-1.48)*
Premarital sex				
No	1.00	referent	1.00	referent
Yes	2.11	(1.69-2.63)*	1.39	(1.08-1.78)*

Abbreviations: OR, odds ratio; CI, confidence interval
*Significant values

Table 6: Bivariate analysis for circumcision and sociodemographic characteristics associated with premarital sex

Characteristics	Premarital sex	
	OR	**95% CI**
Circumcised		
No	1.00	referent
Yes	.822	(.659-1.03)
Age groups		
15-19	1.00	referent
20-24	2.26	(1.33-3.83)*
25-29	2.44	(1.46-4.06)*
30-34	2.71	(1.59-4.61)*
35-39	3.39	(1.99-5.79)*
40-44	2.13	(1.23-3.69)*
45-49	3.33	(1.96-5.65)*
Highest level of education		
Secondary or higher	1.44	(1.07-1.94)*
Primary	.974	(.791-1.20)
No Education	1.00	referent
Marital Status		
Never married	NA	NA
Married/living together	.965	(.733-1.27)
Divorced/Separated/Widowed	1.00	referent
Religion		
Catholic	2.33	(.777-6.96)
Orthodox	1.69	(1.29-2.20)*
Protestant	1.00	referent
Muslim	1.19	(.870-1.62)
Traditional	.636	(.301-1.35)
Others	.417	(.061-2.84)
Ethnicity		
Oromo	1.00	referent
Amhara	1.29	(.990-1.69)
Tigray	1.25	(.913-1.70)
Affar	.382	(.248-.590)*
Somali	.783	(.553-1.11)
Guragie	1.14	(.657-1.98)
Sidama	.430	(.250-.738)*
Welaita	.984	(.527-1.84)
Hadiya	1.06	(.570-1.95)
Others	.797	(.375-1.69)

Table 6: Bivariate analysis for circumcision and sociodemographic characteristics associated with premarital sex (continued)

Characteristics	Premarital sex	
	OR	95% CI
Residence		
Rural	1.00	referent
Urban	1.53	(1.21-1.92)*
Region		
Somali	1.00	referent
Tigray	1.48	(1.01-2.15)*
Afar	.615	(.411-.920)*
Amhara	1.49	(1.06-2.10)*
Oromia	1.16	(.827-1.64)
Benishangula	1.22	(.853-1.74)
SNPR	.924	(.649-1.32)
Gambela	1.59	(1.04-2.44)*
Harari	1.68	(1.11-2.55)*
Addis Ababa	3.48	(2.47-4.89)*
Dire Dawa	1.34	(.920-1.95)
Wealth index		
Poor	1.00	referent
Average	1.04	(.811-1.33)*
Rich	1.39	(1.09-1.77)*
Early sexual debut		
No	1.00	referent
Yes	1.39	(1.08-1.78)*
Multiple lifetime sex partners		
No	1.00	referent
Yes	2.11	(1.69-2.63)*

Abbreviations: OR, odds ratio; CI, confidence interval; NA, not applicable
*Significant values

Table 7: Multivariate analysis for circumcision and sociodemographic characteristics associated with sexual behaviors

Characteristics	Multiple lifetime number of sexual partners		Early sexual debut	
	OR	95% CI	OR	95% CI
Circumcised				
No	1.00	referent	1.00	referent
Yes	.748	(.566-.988)*	.949	(.709-1.27)
Age groups				
15-19	1.00	referent	1.84	(1.12-3.00)*
20-24	1.92	(1.08-3.39)*	.866	(.571-1.31)
25-29	1.99	(1.15-3.46)*	.961	(.686-1.35)
30-34	2.81	(1.62-4.90)*	1.00	referent
35-39	3.62	(2.07-6.31)*	1.01	(.697-1.46)
40-44	5.67	(3.20-10.04)*	1.34	(.924-1.94)
45-49	3.96	(2.12-7.41)*	1.30	(.839-2.01)
Highest level of education				
Secondary or higher	1.00	referent	.643	(.490-.844)*
Primary	1.40	(.886-2.21)	.248	(.148-.415)*
No Education	1.62	(1.01-2.60)*	1.00	referent
Marital Status				
Never married	1.00	referent	.818	(.419-1.60)
Married/living together	.669	(.439-1.02)	1.00	referent
Divorced/Separated/Widowed	1.47	(.940-2.30)	1.07	(.792-1.45)
Religion				
Catholic	1.00	referent	1.29	(.300-5.54)
Orthodox	3.92	(.702-21.92)	1.43	(1.06-1.95)*
Protestant	1.65	(.292-9.35)	.889	(.645-1.22)
Muslim	1.92	(.338-10.90)	1.00	referent
Traditional	.002	(<.001-.023)*	1.33	(.743-2.37)
Others	7.38	(.720-75.70)	2.80	(.254-30.83)
Ethnicity				
Oromo	1.00	referent	1.00	referent
Amhara	3.17	(2.32-4.35)*	2.11	(1.58-2.83)*
Tigray	2.30	(1.44-3.67)*	1.36	(.916-2.03)
Affar	.675	(.412-.1.11)	.759	(.480-1.20)
Somali	.516	(.324-.821)*	.647	(.393-1.06)
Guragie	.774	(.459-1.31)	.917	(.383-2.20)
Sidama	.388	(.164-.919)*	1.78	(1.06-3.01)*
Welaita	.882	(.432-1.80)	1.04	(.350-3.06)
Hadiya	.076	(.012-.495)*	.948	(.311-2.90)
Others	1.21	(.539-2.70)	.468	(.183-1.19)

Table 7: Multivariate analysis for circumcision and sociodemographic characteristics associated with sexual behaviors (continued)

Characteristics	Multiple lifetime number of sexual partners		Early sexual debut	
	OR	95% CI	OR	95% CI
Residence				
Rural	1.00	referent	1.00	referent
Urban	1.71	(1.17-2.50)*	.940	(.683-1.29)
Region				
Somali	1.00	referent	1.00	referent
Tigray	3.97	(2.39-6.60)*	2.77	(1.63-4.73)*
Afar	1.82	(1.06-3.13)*	1.73	(1.02-2.95)*
Amhara	5.94	(3.72-9.49)*	3.73	(2.27-6.12)*
Oromia	1.88	(1.16-3.02)*	1.65	(1.00-2.72)
Benishangula	4.34	(2.30-8.18)*	2.25	(1.21-4.20)*
SNPR	1.31	(.741-2.32)	2.15	(1.21-3.81)*
Gambela	4.74	(2.47-9.08)*	3.76	(1.68-8.44)*
Harari	1.60	(.894-2.87)	1.51	(.742-3.07)
Addis Ababa	4.52	(2.50-8.18)*	1.05	(.561-1.97)
Dire Dawa	2.26	(1.23-4.13)*	1.27	(.740-2.19)
Wealth index				
Poor	1.00	referent	1.00	referent
Average	.990	(.722-1.36)	.926	(.686-1.25)
Rich	.982	(.728-1.33)	.963	(.735-1.26)
Premarital sex				
No	1.00	referent	1.00	referent
Yes	1.92	(1.49-2.48)*	1.27	(.961-1.68)

Abbreviations: OR, odds ratio; CI, confidence interval
*Significant values

Table 8: Multivariate analysis for circumcision and sociodemographic characteristics associated with premarital sex among married women

Characteristics	Premarital sex	
	OR	95% CI
Circumcised		
No	1.00	referent
Yes	.892	(.693-1.15)
Age groups		
15-19	1.00	referent
20-24	2.34	(1.32-4.13)*
25-29	2.45	(1.39-4.32)*
30-34	2.88	(1.59-5.20)*
35-39	3.43	(1.91-6.18)*
40-44	1.98	(1.06-3.72)*
45-49	3.40	(1.89-6.13)*
Highest level of education		
Secondary or higher	1.23	(.815-1.85)
Primary	1.06	(.828-1.37)
No Education	1.00	referent
Marital Status		
Never married	NA	NA
Married/living together	1.27	(.922-1.74)
Divorced/Separated/Widowed	1.00	referent
Religion		
Catholic	2.38	(.598-9.46)
Orthodox	1.60	(1.18-2.17)*
Protestant	1.00	referent
Muslim	1.37	(.960-1.95)
Traditional	.892	(.432-1.85)
Others	.056	(.007-.423)*
Ethnicity		
Oromo	1.00	referent
Amhara	.940	(.677-1.31)
Tigray	1.11	(.705-1.75)
Affar	.529	(.325-.860)*
Somali	.844	(.567-1.26)
Guragie	.771	(.440-1.35)
Sidama	.374	(.214-.652)*
Welaita	.789	(.423-1.47)
Hadiya	.983	(.554-1.75)
Others	.600	(.285-1.26)

Table 8: Multivariate analysis for circumcision and sociodemographic characteristics associated with premarital sex among married women (continued)

Characteristics	Premarital sex	
	OR	95% CI
Residence		
Rural	1.00	referent
Urban	1.29	(.938-1.79)
Region		
Somali	1.00	referent
Tigray	.976	(.598-1.59)
Afar	.562	(.371-.851)*
Amhara	.946	(.618-1.45)
Oromia	.978	(.665-1.40)
Benishangula	1.05	(.660-1.66)
SNPR	.800	(.512-1.25)
Gambela	1.18	(.740-1.88)
Harari	1.41	(.887-2.23)
Addis Ababa	1.97	(1.23-3.15)*
Dire Dawa	1.01	(.660-1.66)
Wealth index		
Poor	1.00	referent
Average	1.04	(.793-1.36)
Rich	1.10	(.808-1.49)
Early sexual debut		
No	1.00	referent
Yes	1.25	(.942-1.66)
Multiple lifetime sex partners		
No	1.00	referent
Yes	1.87	(1.45-2.41)*

Abbreviations: OR, odds ratio; CI, confidence interval; NA, not applicable
*Significant values